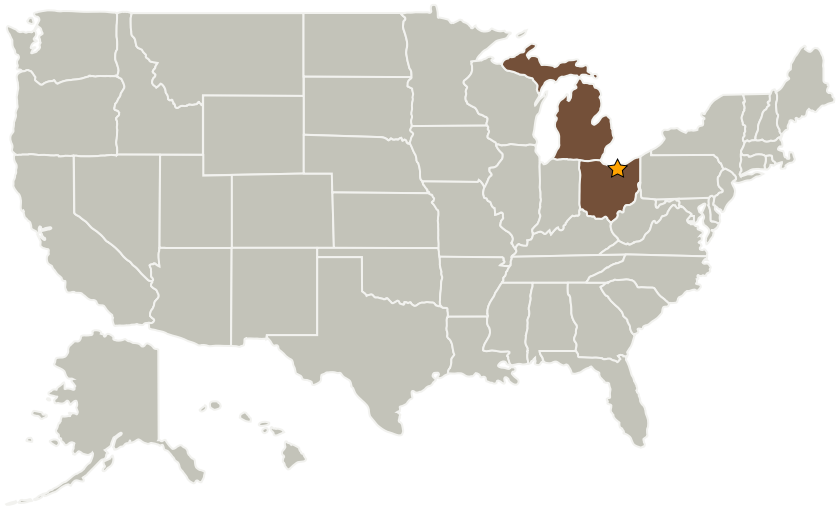
High Energy Density Capacitors, Phase I

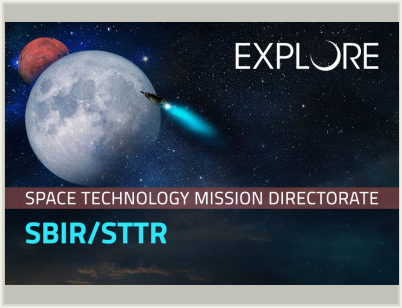
Completed Technology Project (2004 - 2004)

Project Introduction

NASA?s future space science missions cannot be realized without the state of the art energy storage devices which require high energy density, high reliability, and low cost dielectric materials. T/J Technologies proposes to develop and demonstrate high energy density, fast-rise, and high reliability dielectric materials for these applications. The key element of our approach is the development and demonstration, in a breadboard configuration, the feasibility of a new high energy density polymeric dielectric film based on organic-inorganic nanocomposites with tailored structure and composition that will increase the dielectric constant and dielectric strength of the host polymer, polypropylene. This material will possess the high reliability, high dielectric constant, and high dielectric strength needed to develop energy storage devices such as capacitors that will meet or exceed the stored power system needs for the aforementioned applications. Future work of this proposed research, during phase II, will be mainly focused on developing all the associated technologies. The research will enable the development of high-energy electrical storage systems that is critical for NASA space mission as well as for tactical and strategic pulse power applications such as electric armor, particle beam accelerators, high power microwave sources and ballistic missile applications

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
T/J Technologies, Inc.	Supporting Organization	Industry	Ann Arbor, Michigan

Primary U.S. Work Locations	
Michigan	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Junqing Ma

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines